VOLUME CONTENTS

Volume 7, Number 1		January 1994
M. A. Reuter and D. Bernhard	1	The simulation and identification of metallurgical kinetic processes using a generalised kinetic rate equation and trained neural nets
A. Desbiens, D. Hodouin, K. Najim and F. Flament	21	Long-range predictive control of a rougher flotation unit
E. Kusaka, Y. Arimoto, Y. Nakahiro and T. Wakamatsu	39	Collectorless liquid-liquid extraction of fine mineral particles using various organic liquids as the oil phase
C. Abbruzzese, S. Ubaldini, F. Veglio and L. Toro	49	Preparatory bioleaching to the conventional cyanidation of arsenical gold ores
B. V. Mihaylov and J. L. Hendrix	61	Biological decomposition of cyanide in sewage sludge
J. S. J. van Deventer and P. F. van der Merwe	71	Factors affecting the elution of gold cyanide from activated carbon
J. A. González-Domínguez	87	A review of lead and zinc electrodeposition control by polarization techniques
W. W. Fisher	99	Technical Notes Comparison of chalcocite dissolution in the sulfate, perchlorate, nitrate, chloride, ammonia, and cyanide systems
J. Valenzuela, M. Bourassa, K. Najim and R. del Villar	105	Dynamic matrix control of an autogenous grinding circuit
	115	Calendar of International Conferences, Symposia, Courses and Meetings of Interest
	118	Conference Reports
	122	Recent Mineral Processing Publications
	i	Information for Contributors

SPECIAL ISSUE

MINERALS ENGINEERING '93

Proceedings of the International Conference held at the Cape Sun Hotel, Cape Town, South Africa 25–27 August 1993

B. A. Wills and C. T. O'Connor	125	Minerals Engineering '93—Opening Remarks
R. P. King	129	Comminution and liberation of minerals
G. Johnson, I. Hunter and H. Holle	141	Quantifying and improving the power efficiency of SAG milling circuits
L. Elber, D. Thomson and G. Johnson	153	Development of a control system for a SAG-B-C grinding circuit
M. S. Powell and L. A. Vermeulen	169	The influence of liner design on the rate of production of fines in a rotary mill
D. Yan and R. Eaton	185	Breakage properties of ore blends
B. Knelson and R. Jones	201	"A new generation of Knelson concentrators": a totally secure system goes on line
Y. B. He and J. S. Laskowski	209	Effect of dense medium properties on the separation performance of a dense medium cyclone
G. K. Loveday and J. J. Cilliers	223	Fluid flow modelling on spiral concentrators
J. M. Laukkanen and J. O. Leppinen	239	Application of eMAX image analysis to pressure oxidation of refractory gold ores
P. T. E. Boshoff	251	Cyanide-free AARL elutions are feasible
J. S. J. van Deventer, L. Lorenzen, P. F. van der Merwe, D. W. Morrison and J. P. W. van der Westhuysen	265	The fundamentals of unit operations in CIP plants: a progress report
M. A. Reuter, J. Krüger, Y. Dong and T. Yang	279	Direct reduction during the production of ferro- niobium in an electric furnace
A. D. Bailey and G. S. Hansford	293	Oxygen mass transfer limitation of batch bio- oxidation at high solids concentration
J. D. Miller and M. R. Yalamanchili	305	Fundamental aspects of soluble salt flotation

G. J. Harbort, B. R. Jackson and E. V. Manlapig	319	Recent advances in Jameson flotation cell technology
J. B. Yianatos, L. G. Bergh, O. U. Durán, F. J. Díaz and N. M. Heresi	333	Measurement of residence time distribution of the gas phase in flotation columns
L. G. Bergh and J. B. Yianatos	345	Experimental studies on flotation column dynamics
P. R. Visser, M. L. Coetzee and S. G. Kendall	357	Flotation of autogenously milled material
J. G. Park and D. S. Dodd	371	The Merelani graphite project — Tanzania
J. W. Neale and A. Pinches	389	Determination of gas-liquid mass-transfer and solids- suspension parameters in mechanically-agitated three-phase slurry reactors
B. Patchejieff, St. Gaidarjiev and D. Lazarov	405	Technical Note Opportunities for fine gold recovery from a copper flotation circuit using a Knelson concentrator
	411	Minerals Engineering '93 Registered Delegates
	421	Faces at Minerals Engineering '93
	423	Calendar of International Conferences, Symposia, Courses and Meetings of Interest
	426	Conference Reports
Zhenghe Xu	427	Book Reviews Mineral Processing Technology (5th Edition), by B. A. Wills
J. Abbott	428	Advanced Coal Preparation Monograph Series, Volume VII, Part 16, Control Concepts, by C. J. Clarkson
	430	Recent Mineral Processing Publications
	433	Call for Papers
	1	Information for Contributors
Volume 7, Number 4		April 1994

Volume 7, Number 4		April 1994
G. Deschênes, D. Bernard, P. J. H. Prud'homme and D. Laforest	435	A preliminary techno-economic evaluation of the extraction of gold from a chalcopyrite concentrate using thiourea
Qingxia Liu and F. J. Friedlaender	449	Fine particle processing by magnetic carrier methods

Volume Contents

P. Diaz-Penafiel and G. S. Dobby	465	Kinetic studies in flotation columns: bubble size effect
A. M. E. Rizk, H. A. A. El-Sageer and M. A. Doheim	479	Examination of single and repetitive impact breakage
		Technical Notes
M. Falutsu	491	Measurement of the degree of liberation of a mineral
Yigen Zeng and E. Forssberg	495	Monitoring grinding parameters by vibration signal measurement—a primary application
D. Lazarov, L. Alexandrova and I. Nishkov	503	Effect of temperature on the kinetics of froth flotation
R. C. Carson and J. Simandl	511	Kinetics of magnesium hydroxide precipitation from seawater using slaked dolomite
	519	Calendar of International Conferences, Symposia, Courses and Meetings of Interest
		Book Reviews
R. P. Edwards	522	Mineralization in the British Isles, edited by R. A. D. Patrick and D. A. Polya
A. Butcher	522	Quantitative Data File for Ore Minerals, edited by A. J. Criddle and C. J. Stanley
	524	Recent Mineral Processing Publications
	526	Final Call for Papers
	527	New Patents
	Ī	Information for Contributors

Volume 7, Number 5/6

May/June 1994

SPECIAL ISSUE

MINERALS ENGINEERING '93

Proceedings of the International Conference held at the Cape Sun Hotel, Cape Town, South Africa 25-27 August 1993

J. J. Cilliers, L. G. Austin, P. Leger and A. Deneys	533	A method of investigating rod motion in a laboratory rod mill
M. A. Tüzün and B. K. Loveday	551	Fine milling of chromite sand in a 5-litre stirred ball mill

R. A. Williams, I. L. Albarran de Garcia Colon, M. S. Lee and E. J. Roldan Villasana	561	Design targeting of hydrocyclone networks
V. G. Beniuk, C. A. Vadeikis and J. N. Enraght-Moony	577	Centrifugal jigging of gravity concentrate and tailing at Renison Limited
G. Banini and W. Stange	591	Modelling of the AARL elution process
E. Vardar, R. H. Eric and F. K. Letowski	605	Acid leaching of chromite
D. A. Holtum and D. M. Murray	619	Bacterial heap leaching of refractory gold/sulphide ores
G. Akdogan and R. H. Eric	633	Carbothermic reduction behaviour of Wessel man- ganese ores
R. D. Pascoe and B. A. Wills	647	Selective aggregation of ultrafine hematite and quartz under high shear conditions with conventional flotation collectors
D. Hewitt, D. Fornasiero and J. Ralston	657	Bubble particle attachment efficiency
J. P. Tucker, D. A. Deglon, JP. Franzidis, M. C. Harris and C. T. O'Connor		An evaluation of a direct method of bubble size distribution measurement in a laboratory batch flotation cell
D. J. Bradshaw and C. T. O'Connor	681	The flotation of pyrite using mixtures of dithio- carbamates and other thiol collectors
G. Hodgkinson, R. F. Sandenbergh, C. J. Hunter and J. R. de Wet	691	Pyrite flotation from gold leach residues
M. C. Harris, JP. Franzidis, A. W. Breed and D. A. Deglon	699	An on-site evaluation of different flotation technologies for fine coal beneficiation
J. Raiston	715	The chemistry of galena flotation: principles and practice
J. H. P. Watson	737	Status of superconducting magnetic separation in the minerals industry
J. Svoboda	747	The effect of magnetic field strength on the efficiency of magnetic separation
Zhengnan Li and J. H. P. Watson	759	A study of vortex magnetic separation (VMS) with a high-speed video system

Volume Contents

*		
J. H. P. Watson	769	Selectivity and mechanical retention in the magnetic separation of polydisperse, mixed mineral particle systems—Part 1
C. Aldrich, J. S. J. van Deventer and M. A. Reuter	793	The application of neural nets in the metallurgical industry
G. Coetzer, S. J. Foster and P. J. Harris	811	Use of surface area and porosity to characterise the chemical upgrading of ilmenite
	827	Calendar of International Conferences, Symposia, Courses and Meetings of Interest
	830	Conference Report
N. J. Miles	832	Book Review Advanced Coal Preparation Monograph Series by C. J. Clarkson, J. C. Donnelly and A. G. Waters
	833	Proceedings of the Sixth Australian Coal Preparation Conference <i>edited by J. J. Davis</i>
	834	Recent Mineral Processing Publications
	- 1	Information for Contributors
Volume 7, Number 7		July 1994
Volume 7, Number 7 C. T. O'Connor and R. C. Dunne	839	July 1994 The flotation of gold bearing ores—a review
C. T. O'Connor		
C. T. O'Connor and R. C. Dunne W. T. Yen, S. Jin, G. Deschenes		The flotation of gold bearing ores—a review Comparison of elution methods for carbon loaded with gold thiourea complex
C. T. O'Connor and R. C. Dunne W. T. Yen, S. Jin, G. Deschenes and J. McMullen R. K. Mensah-Biney, K. J. Reid	851 865	The flotation of gold bearing ores—a review Comparison of elution methods for carbon loaded with gold thiourea complex Kinetics of gold loading from bromide solution onto
C. T. O'Connor and R. C. Dunne W. T. Yen, S. Jin, G. Deschenes and J. McMullen R. K. Mensah-Biney, K. J. Reid and M. T. Hepworth	851 865	The flotation of gold bearing ores—a review Comparison of elution methods for carbon loaded with gold thiourea complex Kinetics of gold loading from bromide solution onto an anion exchange resin
C. T. O'Connor and R. C. Dunne W. T. Yen, S. Jin, G. Deschenes and J. McMullen R. K. Mensah-Biney, K. J. Reid and M. T. Hepworth G. Newcombe and J. Ralston C. Kant, S. R. Rao	851 865 889	The flotation of gold bearing ores—a review Comparison of elution methods for carbon loaded with gold thiourea complex Kinetics of gold loading from bromide solution onto an anion exchange resin Bubble spreading kinetics and mineral flotation Distribution of surface metal ions among the products
C. T. O'Connor and R. C. Dunne W. T. Yen, S. Jin, G. Deschenes and J. McMullen R. K. Mensah-Biney, K. J. Reid and M. T. Hepworth G. Newcombe and J. Ralston C. Kant, S. R. Rao and J. A. Finch P. R. G. Brandao, L. G. Caires	851 865 889 905	The flotation of gold bearing ores—a review Comparison of elution methods for carbon loaded with gold thiourea complex Kinetics of gold loading from bromide solution onto an anion exchange resin Bubble spreading kinetics and mineral flotation Distribution of surface metal ions among the products of chalcopyrite flotation Vegetable lipid oil-based collectors in the flotation of

P. Bevilacqua and G. Ferrara	943	Carry-over of water and suspension of fines by coarser particulate solids—its influence on the design of DMS regeneration circuits
	951	Calendar of International Conferences, Symposia, Courses and Meetings of Interest
	959	Conference Report
S. Luke	961	Book Review A Hyper-Manual on Expert Systems v.2.0, by J. A. Meech and S. Kumar
	963	Recent Mineral Processing Publications
	1	Information for Contributors

Volume 7, Numbers 8

August 1994

SPECIAL ISSUE

ENVIRONMENTAL ASPECTS OF MINERALS ENGINEERING

Proceedings of the International Symposium held at the Cape Sun Hotel, Cape Town, South Africa 27 August 1993

B. A. Wills	965	International Symposium on Environmental Aspects of Minerals Engineering: opening remarks
K. Atkinson	967	The role of mineral processing in reducing the environmental impact of mining activity in Cornwall, U.K.
R. J. Wilson, T. J. Veasey and D. M. Squires	975	The application of mineral processing techniques for the recovery of metal from post-consumer wastes
S. M. Hay and W. J. Rankin	985	Recovery of iron and zinc from blast furnace and basic oxygen furnace dusts: a thermodynamic evaluation
J. Cordery, A. J. Wills, K. Atkinson and B. A. Wills	1003	Extraction and recovery of silver from low-grade liquors using microalgae
J. H. P. Watson and D. C. Ellwood	1017	Biomagnetic separation and extraction process for heavy metals from solution
J. L. Broadhurst	1029	Neutralisation of arsenic bearing Biox® liquors
G. Moffat, R. A. Williams, C. Webb and R. Stirling	1039	Selective separations in environmental and industrial processes using magnetic carrier technology

G. J. Brown, N. J. Miles

and S. T. Hall

Volume Contents

gas desulphurisation

1057 Fractal assessment of finely ground limestone for flue

	1069	Calendar of International Conferences, Symposia, Courses and Meetings of Interest
	1072	Recent Mineral Processing Publications
	1	Information for Contributors
Volume 7, Number 9		September 1994
Z. A. Zhou, Zhenghe Xu and J. A. Finch	1073	On the role of cavitation in particle collection during flotation—a critical review
Ta-Wui Cheng, A. C. Partridge, Tam Tran and P. L. M. Wong	1085	The surface properties and flotation behaviour of xenotime
S. Banisi, J. A. Finch and A. R. Laplante	1099	On-line gas and solids holdup estimation in solid-liquid-gas systems
Z. Aktas and E. T. Woodburn	1115	The adsorption behaviour of nonionic reagents on two low rank British coals
M. Agus, G. Bonifazi and P. Massacci	1127	Image texture analysis based procedure to characterise and recognise coal macerals
D. W. Moolman, C. Aldrich, J. S. J. van Deventer and W. W. Stange	1149	Digital image processing as a tool for on-line monitoring of froth in flotation plants
M. D. Adams	1165	Removal of cyanide from solution using activated carbon
S. Makni and D. Hodouin	1179	Recursive BILMAT algorithm: an on-line extension of data reconciliation techniques for steady-state bilinear material balance
N. A. Abdel-Khalek, A. Yehia and S. S. Ibrahim	1193	Technical Note Beneficiation of Egyptian feldspar for application in the glass and ceramics industries
	1203	Calendar of International Conferences, Symposia, Courses and Meetings of Interest
	1205	Conference Reports
	1208	Announcements
	1209	Book Review A Textbook of Hydrometallurgy, by Fathi Habashi

Conference Proceedings

A. G. Paithankar et al.

1210 The Impact of Mining on the Environment, edited by

1211 Recent Mineral Processing Publications

I Information for Contributors

Volume 7, Number 10		October 1994
S. R. La Brooy, H. G. Linge and G. S. Walker	1213	Review of gold extraction from ores
C. Bazin, R. Grant, M. Cooper and R. Tessier	1243	A method to predict metallurgical performances as a function of fineness of grind
T. E. Norgate and K. R. Weller	1253	Selection and operation of high pressure grinding rolls circuits for minimum energy consumption
K. P. Galvin and J. B. Smitham	1269	Use of X-rays to determine the distribution of particles in an operating cyclone
P. Tucker	1281	Modelling wet high intensity magnetic separation: a case study
M. T. A. Reis and J. M. R. Carvalho	1301	Recovery of heavy metals by a combination of two processes: cementation and liquid membrane permeation
G. Puvvada and T. Tran	1313	The cementation of Ag(I) ions from aqueous sodium chloride solutions
C. V. Phillips, K. Ayling, E. Crowther, M. E. Harrison and M. A. Jordan	1327 n	Technical Note Aqueous methods used to determine copper(I) and iron(II) concentrations in the presence of copper(I). copper(II), iron(III), iron(III) and zinc(III) in chloride leach solutions by visible spectrophotometry
	1335	Calendar of International Conferences, Symposia Courses and Meetings of Interest
	1337	Conference Reports
	1341	Call for Papers
	1342	Recent Mineral Processing Publications
	1	Information for Contributors

Volume 7, Number 11		November 1994
E. W. Giesekke and P. J. Harris	1345	The role of polyoxyethylene alkyl ethers in apatite flotation at Foskor, Phalaborwa (South Africa)
Jing-Wu Wang and J. R. G. Andrews	1363	Numerical simulations of liquid flow on spiral concentrators

M. P. Hallewell

and J. W. G. Turner

Volume Contents

A11		
A. E. Elsherief	1387	Influence of galvanic interactions between chalcocite and sphalerite during the early stage of leaching
A. Marciano, L. S. N. Costa and F. F. Lin	1401 s	Utilization of coal-oil agglomerates to recover gold particles
R. J. Wakeman and E. S. Tarleton	1411	A framework methodology for the simulation and sizing of diaphragm filter presses
C. Dufresne, G. Deschênes, D. Cimon and J. Corrigan	1427	Technical Notes Control of cyanidation at Yvan Vézina plant
A. E. C. Peres, A. A. M. Borges and R. Galery	1435	The effect of the dispersion degree on the flotability of an oxidised zinc ore
B. Govindarajan and T. C. Rao	1441	A simple equation for sink-float data
	1447	Calendar of International Conferences, Symposia, Courses and Meetings of Interest
	1449	Conference Reports
	1452	Conference Proceedings
	1453	Call for Papers
	1454	Recent Mineral Processing Publications
	1	Information for Contributors
Volume 7, Number 12		December 1994
R. K. Tuteja, D. J. Spottiswood and V. N. Misra	1459	Mathematical models of the column flotation process. A review
G. Schena and A. Casali	1473	Column flotation circuits in Chilean copper concentrators
M. Falutsu	1487	Direct measurement of gas rate in a flotation machine
X. P. Zheng and H. K. Lin	1495	Mineralogy and flotation of rare-earth-bearing barium fluorophlogopite
J. A. Jirestig and K. S. E. Forssberg	1505	Dispersion of flotation concentrates before magnetic separation
M. G. Cordingley,	1517	Release analysis and its use in the optimisation of the

comminution and gravity circuits at the Wheal Jane

tin concentrator

Volume Contents

xiii

M. P. Allen and R. W. Smith	1527	Dissolution of fibrous silicates in acid and buffered salt solutions
M. A. Reuter	1539	Towards a generalized catalogue for the identification of reaction kinetics in metallurgy and minerals processing using neural nets
S. Banisi and J. A. Finch	1555	Technical Notes Reconciliation of bubble size estimation methods using drift flux analysis
O. Pavez and A. E. C. Peres	1561	Bench scale flotation of a Brazilian monazite ore
	1565	Calendar of International Conferences, Symposia, Courses and Meetings of Interest
	1567	Conference Reports
	1572	Conference Proceedings
	1573	Minerals Engineering Conferences
	1574	Recent Mineral Processing Publications
	i	Volume Contents and Author Index